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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,844	01/18/2005	In Kwan Hwang	CU-4056 WWP	1290
26530	7590	09/19/2007	EXAMINER	
LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1600 CHICAGO, IL 60604			TAYONG, HELENE E	
			ART UNIT	PAPER NUMBER
			2611	
			MAIL DATE	DELIVERY MODE
			09/19/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/521,844	HWANG, IN KWAN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Helene Tayong	2611	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 January 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,8-10,16-18,24 and 25 is/are rejected.
- 7) ☒ Claim(s) 3-7,11-15,19-23 and 26-30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/30/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 8, 9, 10, 16, 17, 18, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (figures 1 and 2) in view of Gohary et al ("An adaptive parallel Interference Cancellation System Employing Soft Decisions for Asynchronous DS/CDMA Multipath Fading Channels", Global Telecommunications Conference 2001. Globecom' 01. IEEE, Vol. 5, pp 3145-3147, 25-29 Nov. 2001, see IDS).

(1) with regards to claims 1, 9, 17 and 24;

The admitted prior art in figures 1 and 2 discloses a multistage adaptive partial parallel interference canceller (PIC) in a downlink receiver having a plurality of channels, for removing multiple access interference (MAI) and interpath interference (IPI), comprising:

a filter matched (26) to a desired walsh code and a scrambling code (fig. 2,  $A_1 W_{i1}(t) S_1(t)$ ) for despreading and integrating output signals of a rake receiver (24) (pg. 4, 12-15);

a hard limiter (20) for performing hard decisions and generating a hard-limited signal;

a re-spreading means for resspreading the hard-limited signal outputted from the hard limiter based on a walsh code and a scrambling code (fig. 2,  $A_1 W_{i1}(t) S_1(t)$ ), and generating a re-spread signal ( fig. 2,  $\hat{b}_{i1}(t)$  and  $Z_{i1}(t)$ );

an interference generator for computing MAI and IPI included in the signal received at the rake receiver ( fig. 2, 22, pg 4, lines 5-11); and

an interference signal (fig. 1,  $r(t)$ ) removing means (Multistage PIC) for removing the MAI and IPI from a signal received at the rake receiver ( fig. 1, page 3, lines 11-13).

The admitted art discloses all of the subject matter disclosed above, but for specifically teaching

(a) a soft limiter for performing soft decisions and generating a soft-limited signal;

(b) a weighting control means cascaded to the soft limiter for controlling a slope of the soft limiter;

(i) regarding item (a) above;

However, Gohary et al in the same field of endeavor teaches a soft limiter (fig. 1) for performing soft decisions and generating a soft-limited signal (page 3145, section I, lines 7-12) ;

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a soft decision limiter as taught by Gohary et al to replace the hard limiter of the admitted art in order to reduce interference. The motivation to replace the hard limiter of the admitted prior art with the soft limiter of Gohary et al would be to obtain more reliable estimates.

(ii) regarding item (b) above;

However, Gohary et al in the same field of endeavor teaches a weighting control means cascaded to the soft limiter for controlling a slope of the soft limiter (page 3146, section, III and fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the a weighting control means cascaded to the soft limiter for controlling a slope of the soft limiter of Gohary et al in the method of the admitted art in order to reduce a bias that arises in decision statistics. The motivation to utilize the method of Gohary et al in the system of the admitted art would be to estimate the error.

(2) with regards to claims 2, 10, 18 and 25;

The admitted prior art further discloses wherein the interference canceller of each

stage (fig. 1, 15 and fig. 2) includes:

a normalizing means for normalizing the signal outputted from the rake receiver by using a sum of squared path gains of each finger of the rake receiver ( fig. 2 pg. 4, lines 1-11), .

4. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art fig. 1 and 2 and Gohary et al (" An adaptive parallel Interference Cancellation System Employing Soft Decisions for Asynchronous DS/CDMA Multipath Fading Channels", Global Telecommunications Conference 2001. Globecom' 01. IEEE, Vol. 5, pp 3145-3147, 25-29 Nov. 2001) as applied to claim 1 above, and further in view of Hoffmann et al (US 20020064182).

(1) with regards to claims 8 and 16;

The admitted art as modified by Gohary et al discloses all of the subject matter discussed above, but for specifically teaching a deinterleaver/decoder for correcting an error of a signal; and an interleaver/encoder for interleaving and encoding.

However, Hoffmann et al in the same field of endeavor teaches a deinterleaver/decoder for correcting an error of a signal (fig. 2, 230 and 220) ; and an interleaver/encoder (120 and 130), for interleaving and encoding.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of Hoffmann et al in the method of the admitted art as modified by Gohary et al in order to encode digital communication signals. The motivation to utilize the method of Hoffmann et al in the system of the admitted art as modified by Gohary et al would be to correct errors.

***Allowable Subject Matter***

5. Claims 3 -7,11-15,19-23 and 26-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The admitted prior art as modified by Gohary does not disclose wherein the soft limiter performs the soft decisions based upon equation expressed as:

$$\tanh(\omega U) = \frac{e^{\omega U} - e^{-\omega U}}{e^{\omega U} + e^{-\omega U}},$$

wherein  $\omega$  denotes the slope at the origin of the function and U represents an input signal.

**Conclusion**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. : Wei et al (US 20040246927) discloses a method for weighting parallel interference cancellation in CDMA mobile communication system.

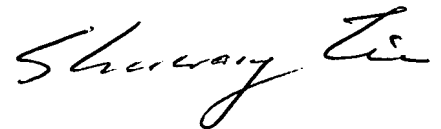
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene Tayong whose telephone number is 571-270-1675. The examiner can normally be reached on Monday-Friday 8:00 am to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Liu Shuwang can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Helene Tayong

9/14/07

A handwritten signature in cursive script, appearing to read "Sherry Lin".